CLAIMS

1. An optical element, comprising:

at least two laminated layers of at least one kind of reflective polarizer (a); and at least one layer of at least one kind of retardation layer (b) for changing polarization properties laminated between the reflective polarizers (a),

the combination of the layers being designed so as to provide a incident-light transmittance depending on an incident angle of an incident light and designed such that a shielded light is not absorbed but reflected, wherein

at least one layer of the reflective polarizer (a) is a circular polarization type reflective polarizer (a1) capable of transmitting a certain circularly polarized light and selectively reflecting an oppositely circularly polarized light;

at least one layer of the reflective polarizer (a) is a linear polarization type reflective polarizer (a2) capable of transmitting one of perpendicular linearly polarized lights and selectively reflecting the other of the perpendicular linearly polarized lights; and

the retardation layer (b) is a layer (b1) having a front (in the normal direction) retardation value of about $\lambda/4$ and having a retardation value of at least $\lambda/8$ with respect to an incident light inclined by at least 30° to the normal direction.

2. The optical element according to Claim 1, wherein

the retardation layer (b1) is a biaxial retardation layer having a front (in the normal direction) retardation value of about $\lambda/4$ and an Nz coefficient of at least 2.0, wherein the Nz coefficient is defined by the formula: (nx-nz)/(nx-ny), where nx and ny are

each principal in-plane refractive indices, and nz is a principal refractive index in the thickness direction; and

the biaxial retardation layer has a slow axis whose direction is set to make an angle of 45°±5° (or -45°±5°) with a polarization axis of the linear polarization type reflective polarizer (a2).

3. The optical element according to Claim 1, wherein

the retardation layer (b1) is a biaxial retardation layer having a front (in the normal direction) retardation value of about λ/4 and an Nz coefficient of at most -1.0, wherein the Nz coefficient is defined by the formula: (nx-nz)/(nx-ny), where nx and ny are each principal in-plane refractive indices, and nz is a principal refractive index in the thickness direction; and

the biaxial retardation layer has a slow axis whose direction is set to make an angle of 45°±5° (or -45°±5°) with a polarization axis of the linear polarization type reflective polarizer (a2).

4. The optical element according to any one of Claims 1 to 3, wherein the retardation layer (b1) is a stretched film comprising at least one material selected from polycarbonate, polysulfone, polyethylene, polypropylene, polyvinyl alcohol, cycloolefin polymers, and norbornene polymers.

5. The optical element according to Claim 1 or 2, wherein the retardation layer (b1) is an oriented film comprising at least one material selected from polyamide, polyimide, polyester, polyetherketone, polyamideimide, and polyesterimide.

6. The optical element according to Claim 1, wherein the retardation layer (b1) is a composite of:

a layer (b11) having a front (in the normal direction) retardation value of about zero and having a retardation value of at least λ/8 with respect to an incident light inclined by at least 30° to the normal direction; and

a uniaxial retardation layer (b12) having a front (in the normal direction) retardation value of about λ/4 and an Nz coefficient of 1.0, wherein the Nz coefficient is defined by the formula: (nx-nz)/(nx-ny), where nx and ny are each principal in-plane refractive indices, and nz is a principal refractive index in the thickness direction, and

the uniaxial retardation layer (b12) has a slow axis whose direction is set to make an angle of 45°±5° (or -45°±5°) with a polarization axis of the linear polarization type reflective polarizer (a2).

7. The optical element according to Claim 6, wherein the layer (b11) having the retardation value has a fixed planar orientation of a cholesteric liquid crystal phase having a reflection wavelength band outside a visible light range.

8. The optical element according to Claim 6 or 7, wherein the uniaxial retardation layer (b12) is a stretched film comprising at least one material selected from polycarbonate, polysulfone, polyethylene, polypropylene, polyvinyl alcohol, cycloolefin polymers, and norbornene polymers.

9. The optical element according to any one of Claims 1 to 8, wherein the circular polarization type reflective polarizer (a1) comprises a cholesteric liquid crystal material.

10. The optical element according to any one of Claims 1 to 9, wherein the linear polarization type reflective polarizer (a2) is a grid polarizer.

11. The optical element according to any one of Claims 1 to 9, wherein the linear polarization type reflective polarizer (a2) is a multilayer thin film laminate comprising at least two layers of at least two materials different in refractive index.

12. The optical element according to Claim 11, wherein the multilayer thin film laminate is a vapor-deposited multilayer thin film.

13. The optical element according to any one of Claims 1 to 9, wherein the linear polarization type reflective polarizer (a2) is a multilayer thin film laminate comprising at least two layers of at least two birefringent materials.

14. The optical element according to Claim 13, wherein the multilayer thin film laminate is a stretched resin laminate comprising at least two layers of at least two birefringent resins.

15. A polarizing element, comprising: the optical element according to any one of Claims 1 to 14; and a dichroic linear polarizer adhered on the outside of the linear polarization type reflective polarizer (a2) of the optical element.

16. A polarizing element, comprising: the optical element according to any one of Claims 1 to 14; and a quarter wavelength plate and a dichroic linear polarizer which are adhered on the

outside of the circular polarization type reflective polarizer (a1) of the optical element.

17. The polarizing element according to Claim 16, wherein the quarter wavelength plate has an Nz coefficient of from -2.0 to -1.0, wherein the Nz coefficient is defined by the formula: (nx-nz)/(nx-ny), where nx and ny are each principal in-plane refractive indices, and nz is a principal refractive index in the thickness direction.

18. A lighting device, comprising: a surface light source; a reflective layer provided on the back side of the surface light source; and the optical element according to any one of Claims 1 to 14 or the polarizing element according to any one of Claims 15 to 17 provided on the front side of the surface light source.

19. A liquid crystal display, comprising: the lighting device according to Claim 18; and a liquid crystal cell provided on a light-emitting side of the lighting device.

20. A wide viewing angle liquid crystal display, comprising: the liquid crystal display according to Claim 19; and a wide viewing angle film that is placed on the view side with respect to the liquid crystal cell in order to diffuse light passing through the liquid crystal cell to the view side.

21. The wide viewing angle liquid crystal display according to Claim 20, wherein the wide viewing angle film comprises a diffusing layer exhibiting substantially no back scattering or depolarization.